Drinking Water Quality Regulator for Scotland

Incident Summary

Lochinvar WTW
pH Failure
11th February 2022

DWQR Inspector:
Moira Malcolm

Event No. 12412

Event Category: Significant

On 14th February 2022 an 'out of specification' report from Scottish Water's Scientific Services highlighted a pH failure taken from Lochinvar WTW final sample tap taken on 11th February. The operator checked the pH monitors on site and noted nothing out of range, as did the process scientist when reviewing telemetry trends; however, when the process scientist arrived on site the following day they found the final water pH above Prescribed Concentration or Value (PCV) , although online instruments were normal. The lime dosing pumps were reduced to bring the dose down and by the evening the pH began to drop to within the PCV range. Reactive sampling for the incident found two pH failures at the WTW final sample point, and a further two in distribution on 15th and 16th February.

Scottish Water's investigation of the incident found that a new on-site bench pH probe had been put into service on 3rd February but it was only being routinely calibrated using buffers of pH 4 and 7, as the pH 10 buffer would only be accepted by the meter intermittently. As a result, the pH meter was not able to accurately read the normal range of pH throughout treatment.

This had not been escalated for the probe to be replaced, nor the issue with the intermittent pH10 buffer calibration stage been reported.

The investigation found that the treated water lime dosing pump stroke had been increasing since 3rd February, but as the pH meter was not reading accurately the pump could not achieve the pH set point of 8.3 and the stroke increased from 35% up to 70% by 7th February. On 5th February the Intelligent Control Centre (ICC) called out a high final pH alarm, but when the operator checked this against the bench meter they assumed the online meter had drifted high and standardised it to match the (actually faulty) bench meter. This then led to all online pH instrumentation reading a lower pH than was accurate, and as a result no high treated water pH alarms were breached. Following the out of spec report when the fault was discovered, all pH probes were found to have a significant drift before calibration but were accurate following subsequent calibration and standardisation. The faulty controlling pH probe had been in storage for some time when it was deployed on 3rd February (replacing a cracked probe).

The event has been categorised as significant. Scottish Water has identified eleven actions which DWQR accepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made two additional recommendations.